REVIEW STATEMENT SUMMARY

SCOPE OF THE REVIEW

Sphera's Managed LCA Content (MLC) provides customers access to more than 20,500 life cycle datasets for products and processes that can be used for the determination and modeling of environmental impacts for individual products and processes. MLC uses specific industry and primary data as well as secondary sources to create comprehensive LCI models for the databases following international standards such as ISO 14040/44. The databases are compatible with nationally and internationally recognized methodologies for impact assessment.

As part of their quality assurance, Sphera asked DEKRA for an independent review of the MLC. The aim of the review was to ensure that:

- the datasets are developed based on relevant, independent and reliable data sources,
- Sphera has the expertise and experience to create LCI models and datasets from these sources,
- datasets are well documented.

The review is planned as an ongoing project with a comprehensive scope.
To highlight the characteristics of datasets from individual categories, the review was divided into core technology sectors. So far, the following sectors have been reviewed:

1) Energy carriers' production, initial processing and transport, and the import/export mixes (2023/24)
2) Metals and minerals, including mining (2023/24)
3) Construction data (2024/25)
4) Petrochemicals (2024/25)
5) Electronics (2025)

This review report refers to the above-mentioned sectors only.

REVIEW PROCESS

To achieve the aim of the review, a well-structured, repeatable review process was defined.
In a first step the decision was made to review each sector separately, in order to ensure a meaningful review result. Hence, each technology sector required an independent reviewer, who was selected by DEKRA based on their specific industry and technology expertise and overall LCA competence.
As each sector included more than 500 datasets, a random sample of datasets was selected of the respective sectors for the following review.
Each of those datasets have been reviewed in regard to its underlying LCI models in Sphera's Master Database as well as its publicly available online documentation.
Throughout the review process the reviewers and Sphera set up feedback channels to address questions, receive clarifications and feedback. This was done via a shared comment list. The comments were discussed during review meetings if necessary and addressed in writing by Sphera.
Furthermore, the reviewers acknowledge the unrestricted access to all requested information, the dedicated efforts of the commissioner to address the comments provided, as well as the open and constructive dialogue during the entire review process.

SUMMARY OF RESULTS

Use of relevant, independent and reliable data sources

Data is mainly taken from industry reports, statistics and scientific literature published by well-known institutions. Data sources used are usually of good quality and can be generally classified as relevant, independent and reliable.
Datasets undergo an annual quality check by internal experts which review the representativeness of the data sources and models. However, during the review it was found that data on key parameters in some of the models of sector 2) needs to be reassessed and updated. The reviewers therefore recommend that the regular updating of these parameters be included in the installed continuous improvement process (audited by DEKRA in 2013) as well as to document the (annual) quality check and a rationale for the decision. During the review of the sectors 3), 4) and 5) it was found that in some cases, results in the updated MLC-model are adjusted, but the documentation does not reflect the corrections made. It should be ensured that the documentation clearly specifies the data's origin.

Availability of specific expertise and experience for LCI modeling
Data sources are combined with the *expertise and experience of Sphera's employees,* of which some have well over 20 years of experience in LCA, to create datasets. Depending on the sector, a systematic/modular approach is used for data collection, processing and modeling which ensures a consistent quality. The general methodological procedure is described in the publicly available 'Sphera Managed LCA Content (MLC) – LCA Databases Modeling Principles'.
During the Master database review only few issues related to modelling were found. Two notable issues identified in the review of sector 3) were inconclusive results for land use change due to an error in the implementation, and small discrepancies in the clinker content between concrete models and documentation. All other points regarding modeling were addressed by Sphera and have either been corrected already or will be addressed during the next database update. The implementation shall be verified by DEKRA in an upcoming review. Discussions with the content team and experts at Sphera also underlined the expertise and experience available.

Sphera has implemented an *internal multi-layer quality assurance process* which consists of individual quality assurance procedures of each model adjustment tracked systematically via a ticketing system, secondly a structured monthly SQL based database consistency assessment and third an overall LCA results evaluation for all datasets. The process is concluded by an additional round of data and model review by dedicated experts. This process provides a sound basis for high-quality datasets. Consistent adherence to the process could not be checked during the review and is subject to future reviews.

Documentation of datasets
Documentation in general is good. Necessary information on underlying technologies, use of the datasets and modeling approaches as well as data sources and datasets used for the model generation is provided for all native MLC content. However, during the review of sector 4) it was found that some datasets are lacking information considering production pathways or used technologies. For sector 5), it is recommended to structure the information in the lengthy paragraphs more clearly.
Data quality indicators which are transparently described in the Sphera Modeling Principles are available for each dataset.
For some of the information given, such as the reference year, the list of included datasets or the flow charts, there is no official definition or uniform rules in relevant standards like ISO 14048, which form the basis for the dataset documentation. As a result, the content of these fields varies throughout the database. In addition, some of the citations given in the data sheets are outdated or could not be traced back to the original source. This sometimes results in incomplete information. Defining rules regarding the content and its update as well as clear definitions that also go beyond the standards, would add great value for the users as it allows for a deeper understanding of the datasets and models behind.

Further details as well as more concrete suggestions for improvement are described in the detailed review reports.

CONCLUSION
As outlined above, due to the large number of datasets it was neither possible nor the main priority of this review to carry out an in-depth analysis of all datasets included in the key technology sectors 1) - 5). The sampled datasets allow to get an impression of all the datasets included in the reviewed sectors. This impression was supplemented by the discussions and written exchanges with Sphera's content team and experts.
Sphera has demonstrated that it has the expertise, experience and processes in place that ensure a high overall model and dataset quality. In addition, the reviewers got the impression that Sphera is determined and capable of further enhancing their processes and increasing the data quality of the MLC.

Stuttgart, 02. March 2026

i.A.

Dr. Nadine Rötzer

Team Lead Product Sustainability
DEKRA Assurance Services GmbH

Dr. Hannes Krieg

Reviewer on behalf of
DEKRA Assurance Services GmbH